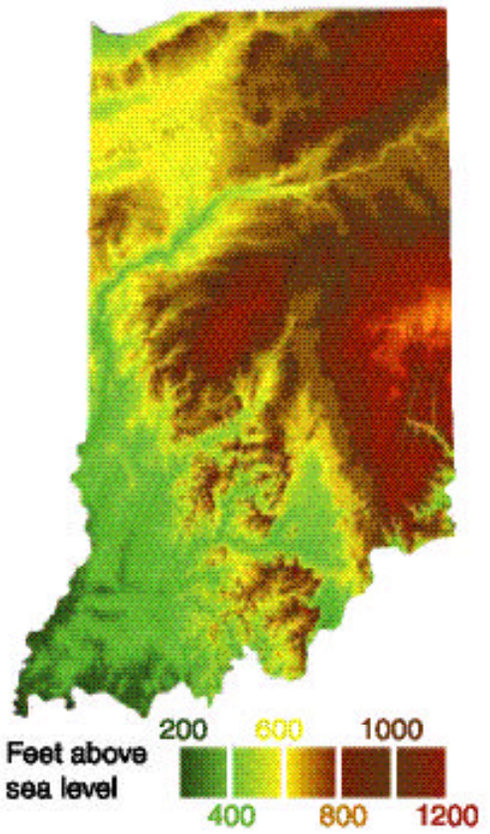
# Land Quality

**Indiana Topography**
Source: Indiana Geological Survey, 1988




## Restoring Natural Resources

Injury to natural resources (surface water, ground water, wetlands, sediment, land, fish, wildlife, air, etc.) at contaminated sites and surrounding areas is assessed by state and federal designated Natural Resource Trustees. If injury is determined, trustees then seek compensation from the responsible party or parties to replace the injured resources. In 2000, more than 230 acres of land were restored or acquired by the Natural Resource Trustees to replace injured resources in Indiana. Since 1997, more than 1,200 acres of land have been restored and/or acquired.

## INDIANA TERRAIN

Indiana covers an area of 36,300 square miles, of which 99 percent is land. Indiana's topography ranges from 324 to 1,257 feet above sea level. The lowest point of elevation is in the southwest corner of Indiana where the Wabash River flows into the Ohio River. The highest point is in Wayne County in east central Indiana in an open field marked by a small pile of stones.

Past waste management practices have caused many significant problems that the state must continue to address, including contaminated sites, leaking underground storage tanks, spills, landfills and open dumps that can contaminate ground water.

Thousands of contaminated Indiana properties require cleanup. Many are actively under investigation or cleanup. Others are yet to be discovered.

Once identified, contaminated sites are assessed for their potential threats to human health and the environment, which determines the approach taken to clean them up.

## CONTAMINATED SITES

Prior to the 1970s, waste disposal was largely uncontrolled. Some industries dumped hazardous wastes onto the land and left drums filled with hazardous materials outside to leak and corrode. Garbage was taken to town dumps where it was burned or buried without environmental safeguards. The result was contaminated sites.

In Indiana, there are thousands of abandoned and operating hazardous waste sites posing significant threats to the environment from contaminants leaking into the land, air and water. Indiana sites include landfills, wood treating facilities, foundries, mining or manufacturing sites, and others. These sites are contaminated with heavy metals, chemicals, pesticides, cleaning solvents, sludges, acids, asbestos, petroleum and other waste materials.

Once a contaminated site is discovered, the type of property, ownership, source, and potential nature and extent of contamination will determine how the site is managed. Descriptions of the general cleanup categories appear on the following pages.

## SUPERFUND CLEANUPS

Sites that are highly contaminated, or pose an immediate threat, may be proposed for inclusion on U.S. EPA's National Priority List (NPL), better known as Superfund. The federal Superfund targets complex, heavily contaminated sites for cleanup, focusing on those sites that pose the greatest health threats.

Superfund sites commonly contain soils contaminated by improperly stored or disposed chemicals. Wetlands, ground water, lakes and rivers may be contaminated through soil contact or storm water runoff. As of 2000, of the 36 Superfund sites in Indiana, cleanup efforts are underway at 14, and cleanup responses are complete and are being monitored at 22.

One of the largest Superfund cleanups underway in the state and possibly across the country is that of the Continental Steel site in the city of Kokomo.

*More information on specific cleanup sites is available at*

**www.in.gov/idem/land/site_information/summaries/index.html .**


**Active** sites are defined as sites where initial investigation, cleanup design or actual cleanup is occurring.

**Completed** sites are sites that have been cleaned up and are being monitored.

## CONTINENTAL STEEL SUPERFUND SITE

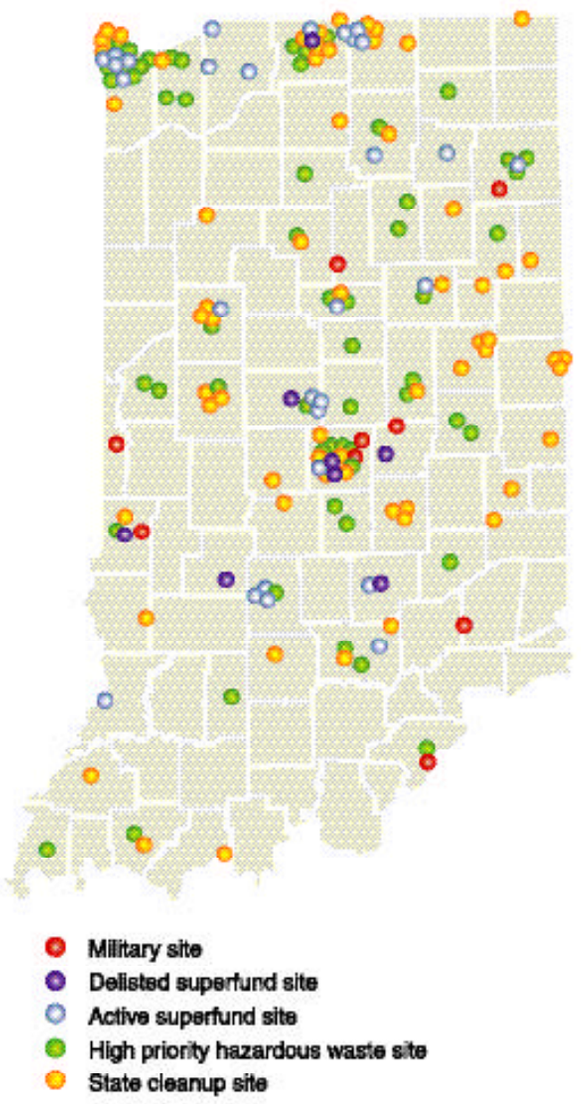
### IDEM Completed Decontamination and Demolition of Main Plant Buildings

This year, IDEM completed one of the largest phases of work for the largest State-lead Superfund site. The decontamination and demolition of 125 buildings and structures at the Continental Steel Main Plant eliminated a threat to nearby residents and cleared the way for remediation of the soils and ground water under this area of the site. The buildings contained the accumulation of many years of dust contaminated from the daily operations at the Continental Steel facility, as well as various containers and piles of waste. Most of the buildings were partially constructed of materials that contained asbestos. In addition to the demolition, the $30 million cleanup included:


- Removal of 151 tons of hazardous solids and sludges;
- Removal of 3,000 tons of non-hazardous waste;
- Removal of 93 tons of PCB-contaminated transformers, capacitors and oil;
- Removal of 2,700 tons of PCB-contaminated concrete;
- Treatment of 2,000,000 gallons of wastewater;
- Removal of 16,800 tons of asbestos; and
- Precleaning of 21 buildings.

## Priority Contaminated Sites

Source: IDEM Office of Land Quality, 2000




## MILITARY BASE CLEANUPS

Military sites that require cleanup due to hazardous waste contamination also fall under Superfund authority. Nine of Indiana's active or closing military bases and several other formerly used defense sites are being investigated or cleaned up. Each military site has many different areas that require cleanup.

## HAZARDOUS WASTE CLEANUPS

Contamination from spills or releases into the environment at currently operating facilities may pose significant environmental concerns. Hazardous waste management facilities are required to investigate areas suspected of being contaminated from past practices or events and perform cleanups, under the Resource Conservation and Recovery Act.

Indiana has approximately 305 hazardous waste facilities subject to investigation and appropriate cleanup; 103 are of significant concern and are currently being addressed, of which 56 are considered high-priority sites.

## STATE CLEANUPS

Indiana has identified an additional 62 contaminated hazardous waste sites around the state. These sites do not qualify as Superfund sites due to the level or nature of contamination, but still present environmental and public health risks. Of the 62 sites identified for potential action, five were cleaned up in 2000.

## BROWNFIELDS REDEVELOPMENT

Brownfields are abandoned or underused industrial or commercial sites where redevelopment is complicated by actual or perceived environmental contamination. Prospective purchasers may be reluctant to purchase a brownfield property because of concerns about legal liability from potential contamination at the site.

Redeveloping brownfields links economic vitality and jobs with environmental protection. To date, 105 Indiana communities identified 208 sites to be redeveloped and returned to productive economic reuse.

## ABANDONED LANDFILLS

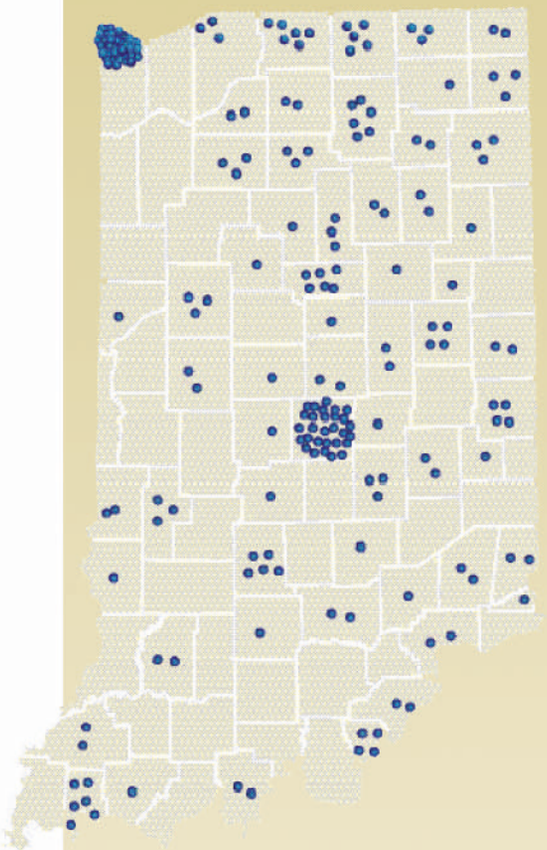
Abandoned landfills are a growing state-wide environmental concern. Even though these sites are not active today, the evidence remains. Many of these abandoned landfills were not properly closed, maintained or monitored. Finding a way to take care of these abandoned landfills today may rest upon the cooperative efforts of the state and local communities.

Could the abandoned landfill be a potential brownfield? Abandoned landfills present a community with many of the same issues as the "traditional" brownfield project. The negatives are present: a) potential for substantial ongoing environmental impacts, b) liability issues, and c) if left unattended, a deterrence to land reuse and development. The positives are there as well:
**(a)** an opportunity to mitigate a site impacting the environment,
**(b)** an opportunity for community awareness and involvement, and
**(c)** land reuse and development opportunities.

Funds necessary to correctly and responsibly close and monitor an abandoned landfill can quickly add up and exhaust most community budgets quickly. Grant assistance and other funding mechanisms available through the Brownfields Program may assist a community in correctly and responsibly meeting the site's needs. Not every site will qualify for assistance, but it is worth an inquiry.

### Brownfields Sites*

Source: IDEM Office of Land Quality, 2000



Brownfields sites

*This map reflects those brownfield sites that have received some assistance through the state's Brownfield Program since inception. In many cases, cities and towns are directly pursuing assessment, cleanup and redevelopment of sites in their communities without state assistance.

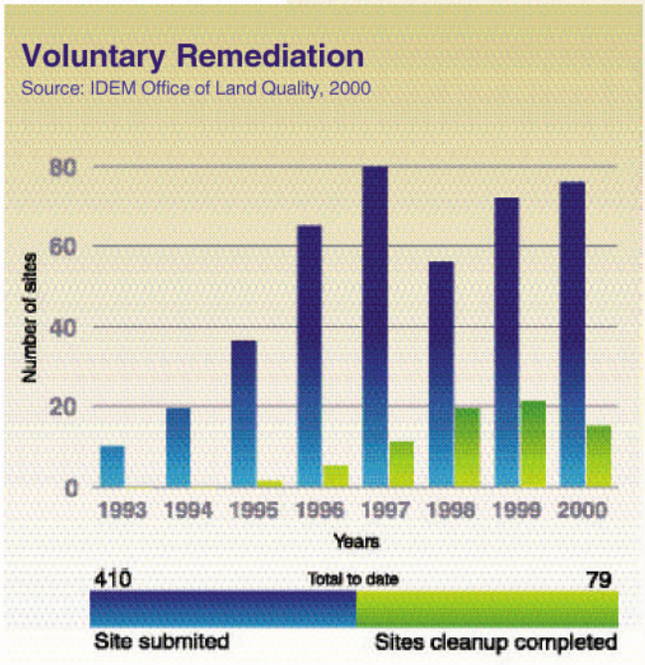
## VOLUNTARY REMEDIATION

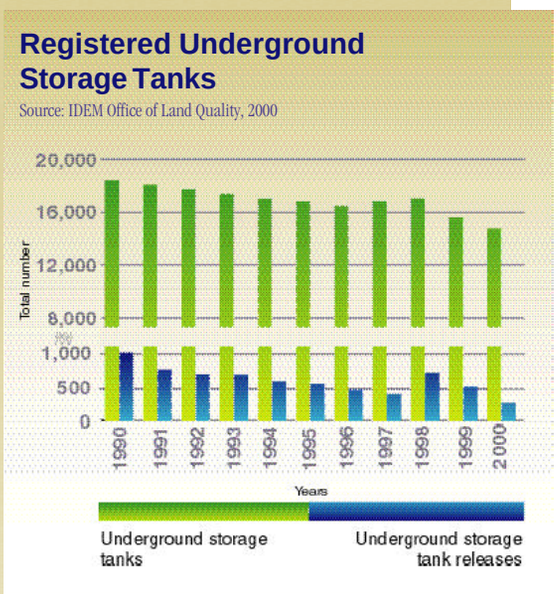
Some property owners choose to initiate clean up of contamination discovered on their properties without being forced to do it. However, they want to be assured their cleanup meets the state requirements. Properties that are cleaned up in this manner are referred to as voluntary remediation sites.

Since 1993, 410 applications have been received by the state, and 290 are currently active projects. To date, 79 sites have been cleaned up.

### Voluntary Remediation

Source: IDEM Office of Land Quality, 2000






## UNDERGROUND STORAGE TANKS

Underground storage tanks at gas stations and other businesses are a common source of soil and ground water contamination. Contaminants such as petroleum products from leaking underground storage tanks threaten human health and the environment. Contaminants can reach drinking water wells or travel as vapors into sewers and basements, creating a fire and explosion danger as well as threatening human health and the environment. These sites are cleaned up by responsible parties or by IDEM.

Since 1990, more than 7,300 regulated underground storage tank leaks have been reported in Indiana. At the end of 2000, 47 percent of these tanks had been approved for clean up and closure. Approximately seven percent of all identified leaking tanks are considered significant threats to humans or the environment and are undergoing cleanup.

Nearly 93 percent of facilities with registered underground storage tanks inspected in 2000 were in compliance with the 1998 federal requirements for leak detection, spill and overfill prevention, and corrosion protection.

## NEW PROGRAM HELPS WITH ABANDONED TANKS

### IDEM PROVIDES FINANCIAL AND TECHNICAL ASSISTANCE

A new IDEM assistance program, the Abandoned Tank Community Assistance Program, is designed to help dozens of Indiana communities address an unintended consequence of new federal rules requiring environmental protections on underground storage tanks.

The rules, passed in 1988, required leak detection and other upgrades be added to tanks by December 1998. Rather than spend the money required, many tank owners abandoned their facilities. Communities ended up acquiring the properties through tax defaults, liens or other actions.

To help cities and towns address this environmental/economic development dilemma, IDEM has established the Abandoned Tank Community Assistance Program. It offers cities and towns free financial and technical assistance with removing or closing the tanks.

IDEM's Abandoned Tank Community Assistance Program is important to communities because:

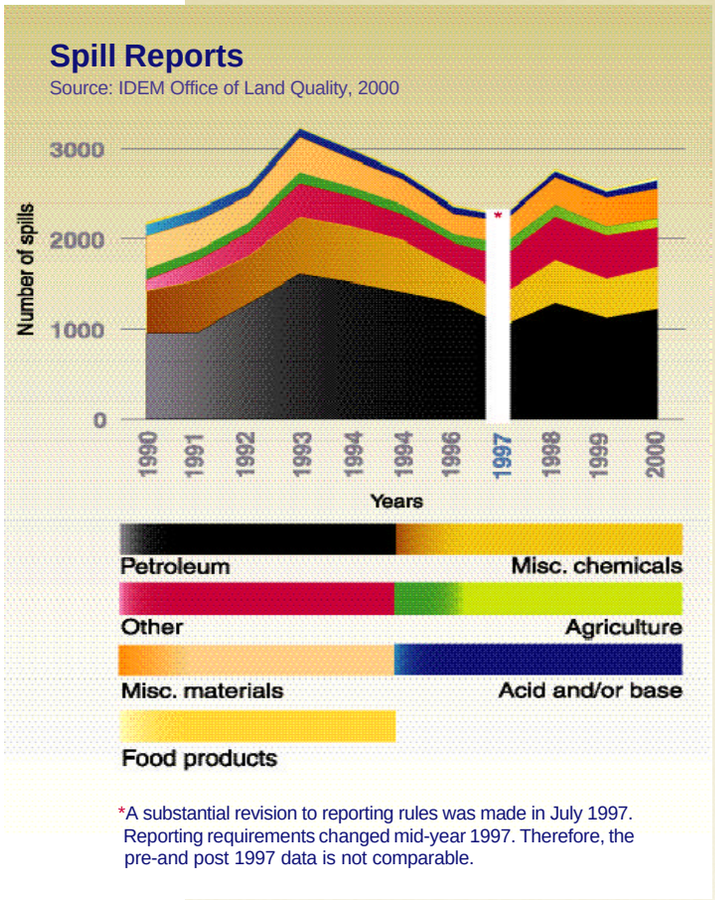
- It reduces potential exposure to hazardous chemicals;
- It facilitates redevelopment of underutilized properties, which can be placed back on tax rolls;

- It removes blight and eyesores from communities;
- It is free assistance for communities, not a loan; and
- The removal/closure process requires little effort or resources from communities.

During the first year of the program, applications for nine communities were approved for assistance with three projects completed in 2000. The remaining sites are scheduled for tank removal during the spring and summer of 2001.

## EMERGENCY RESPONSE

Chemical spills, agricultural related releases, fires, explosions and other disasters endanger human health and the environment. These threats can expose people to hazardous fumes or liquids and/or contaminate drinking water supplies. In 2000, more than 2,600 spills were reported, compared to more than 2,500 in 1999. Reported spills are categorized by priority, based on the amount spilled, the toxicity or other hazards posed by the substance and the location of the spill. In 2000, approximately eight percent of all reported spills caused significant damage or presented an immediate, substantial threat to the environment.




*A substantial revision to reporting rules was made in July 1997. Reporting requirements changed mid-year 1997. Therefore, the pre-and post 1997 data is not comparable.

Report
Chemical Spills
and
Environmental
Emergencies
in Indiana.

Call:
(317) 233-7745
or
Toll Free
(888) 233-SPIL

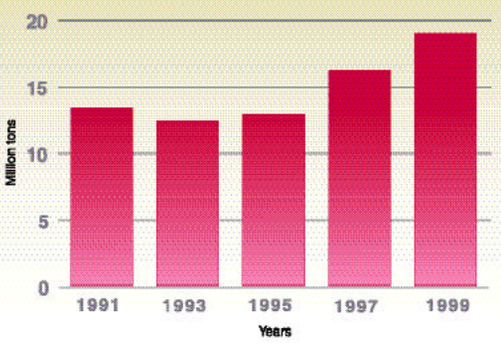
# HAZARDOUS WASTE

## HAZARDOUS WASTE GENERATION

Ignitable, corrosive, reactive or toxic hazardous wastes pose substantial threats to human health and the environment, if they are not properly managed. In 1999, 588 Indiana facilities generated 19 million tons of hazardous waste. Increases since 1995 is likely due to facilities generating more hazardous waste because the economy was producing goods at or near capacity.

### Hazardous Waste Generation

Source: Resource Conservation and Recovery Act Biennial Hazardous Waste Report, 1991-1999




*The "Hazardous Waste Generation" graph above has been adjusted to account for a company reporting a waste stream in 1999 that should have been reported in previous years. This should be taken into consideration when comparing this data to data in previous state of the environment reports.

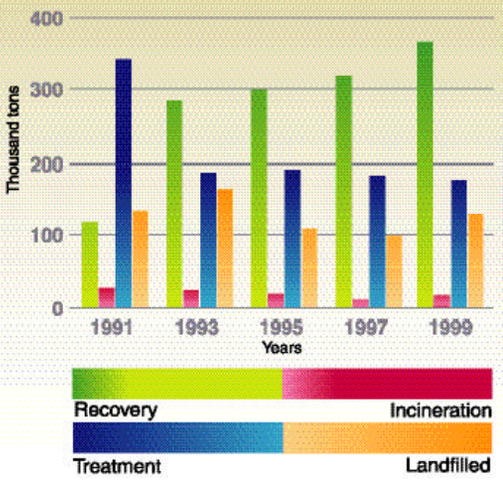
## HAZARDOUS WASTE TREATMENT AND DISPOSAL

Most hazardous waste generated in Indiana is treated on site in treatment systems regulated by the Clean Water Act. During 1999, 95 percent of the hazardous waste generated was treated at the sites of generation. The remaining waste was sent off site to permitted hazardous waste treatment, storage or disposal facilities.

From 1997 to 1999, 13.4 percent (48,000 Tons) of hazardous waste materials were recovered from the waste stream into usable products for commercial or industrial use. Such materials can include metals, solvents, and fuel blending chemicals that can be reprocessed for re-use. Permitted treatment, storage and disposal facilities in Indiana received approximately 697,135 tons of hazardous waste from both in-state and out-of-state sources. This waste was recovered and reused, incinerated, landfilled or otherwise treated.

### Hazardous Waste Management Methods

Source: Resource Conservation and Recovery Act Biennial Hazardous Waste Report, 1991-1999

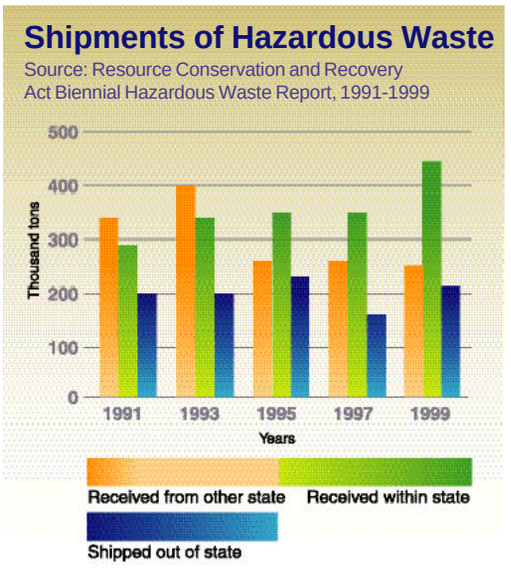



## HAZARDOUS WASTE SHIPMENTS

In 1999, Indiana shipped approximately 211,985 tons of hazardous waste to 28 states, 51,985 tons more than in 1997. Indiana treatment, storage and disposal facilities received approximately 251,297 tons of hazardous waste from 47 states, approximately 10,000 tons less than in 1997.

### Shipments of Hazardous Waste

Source: Resource Conservation and Recovery Act Biennial Hazardous Waste Report, 1991-1999



# SOLID WASTE

## DISPOSAL

Waste that is not diverted from disposal goes to a permitted landfill or incinerator. Disposal rates for all permitted municipal solid waste landfills and transfer stations vary by county, as shown by the map. In 2000, Indiana had 38 operating municipal solid waste landfills, down from 72 in 1991.

## SOURCE REDUCTION AND RECYCLING

Indiana encourages source reduction and recycling, which includes purchasing more durable products for long-term use, finding new uses for old household materials and recycling to reduce waste. In 1990, Indiana established voluntary goals to reduce waste disposal 35 percent by January 1996 and 50 percent by January 2001.

The source reduction and recycling rate for municipal solid waste increased three percentage points between 1996 and 1999 from 29 percent to 32 percent. The goal set by the state in 1990 was aggressive and not reached. However, Indiana's efforts in attaining a 32 percent waste reduction rate is comparable to the national average and the efforts of other mid-western states. The state's programs continue to strive to enhance opportunities and overcome barriers in order to move recycling in Indiana to a higher level.

In 1999, three revisions were made as to how waste disposal reductions are calculated. First, the base year for calculations is 1993 instead of 1991, as information reported is considered more accurate for 1993. Second, adjustments to waste generation are made each year based on changes in the Gross State Product. Third, all waste disposed in commercial landfills is taken into account instead of just household waste.

## HOUSEHOLD HAZARDOUS WASTE

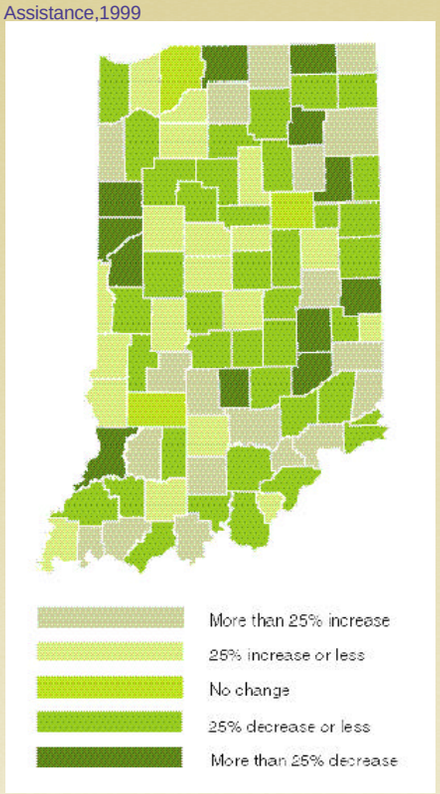
Many common household products contain hazardous substances. Such products may include certain paints, cleaners, stains and varnishes, batteries, motor oil and pesticides. These products become household hazardous waste[1] (HHW) once the consumer no longer has any use for them.

Each person in Indiana produces an average of four pounds of HHW yearly for a total of 11,000 tons annually state wide. Many communities throughout the state of Indiana have established special collection days, or permanent collection sites providing citizens an avenue to dispose of hazardous products to a central location for proper management.

[1]Household hazardous wastes are excluded from being regulated by the hazardous waste rules.

### Disposal Rates Per County,* 1993-1999

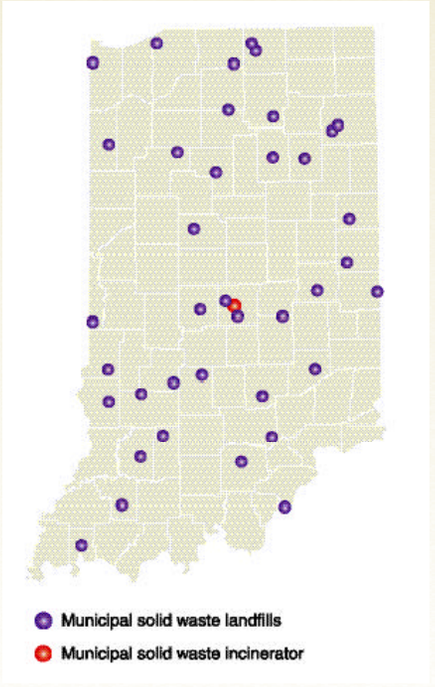
Source: IDEM Office of Land Quality, 1999, 2000; IDEM Office of Pollution Prevention and Technical Assistance,1999




* Based on information reported by Indiana landfills and transfer stations. Information from Ohio and Kentucky was also used. Information from Michigan and Illinois was not available.

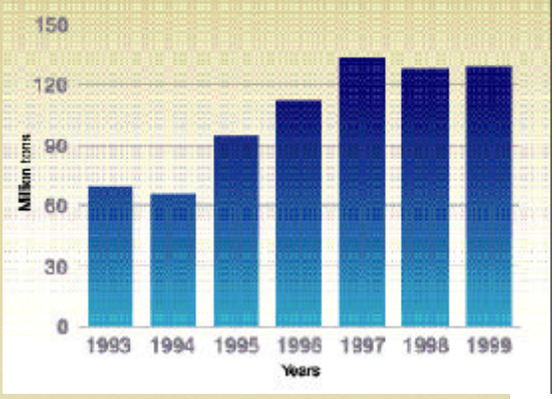
### Municipal Solid Waste Disposal Facilities

Source: IDEM Office of Pollution Prevention and Technical Assistance and Office of Land Quality, 2000



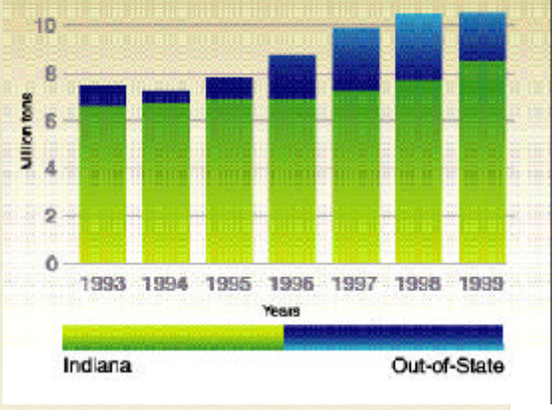
## Solid Waste Landfill Capacity

Source: IDEM Office of Land Quality, 2000




## Solid Waste Disposal in Indiana

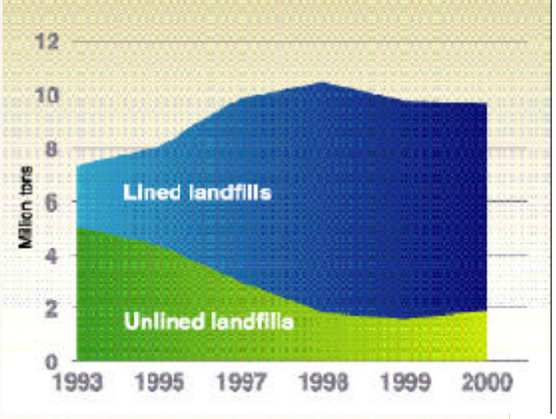
Source: 1999 Indiana Solid Waste Facilities Annual Report




*The disposal numbers include landfilled and incinerated waste.

## Solid Waste Landfill Disposal Methods

Source: 1999 Indiana Solid Waste FacilitiesAnnual Report




# SOLID WASTE LANDFILLS

In 2000, permitted operating solid waste landfills accounted for approximately five square miles of the state's land area. Although the number of landfills is decreasing, the average size of each is growing. At the end of 1999, Indiana's solid waste landfills had a combined capacity of approximately 128 million tons.[1] This is an increase of nearly 34 million tons from the 1995 total capacity. Depending on disposal rates, this landfill space is predicted to last until sometime in 2013.[2] However, it is expected that landfill expansions will continue to provide future capacity.

Waste imports affect the amount of landfill capacity available for Indiana residents and businesses. In 1999, out-of-state trash accounted for 21 percent of the waste disposed in Indiana's solid waste landfills. In contrast, in 1999 an estimated 10 percent of Indiana's solid waste was disposed of out of state.

The design and construction of landfills over the years have improved significantly. New landfill areas are required to have composite liners made with a combination of compacted soil and plastic liners and systems to collect, treat and dispose of contaminated water from the landfill. These requirements help protect ground water from landfill leaks. The amount of Indiana's waste landfilled over composite liners in 2000 was 81 percent, an increase of 33 percent since 1995, but a slight decrease from the 1998 total of 84 percent. This decrease in 2000 is a result of two landfills moving their fill area to areas of the landfill which do not have a composite liner. Liners are required for landfilled areas constructed after 1993. Those areas constructed prior to 1993 were not required to have composite liners.

[1] Gross airspace measure—initial measure in volume, from subgrade to top of final cover. Volume was converted to weight using a factor of two cubic yards per ton. This factor averages compaction rates for all landfills and accounts for volume reductions due to liners, daily and final cover.

[2] Based on the assumption that disposal rates will remain at 1998 levels.

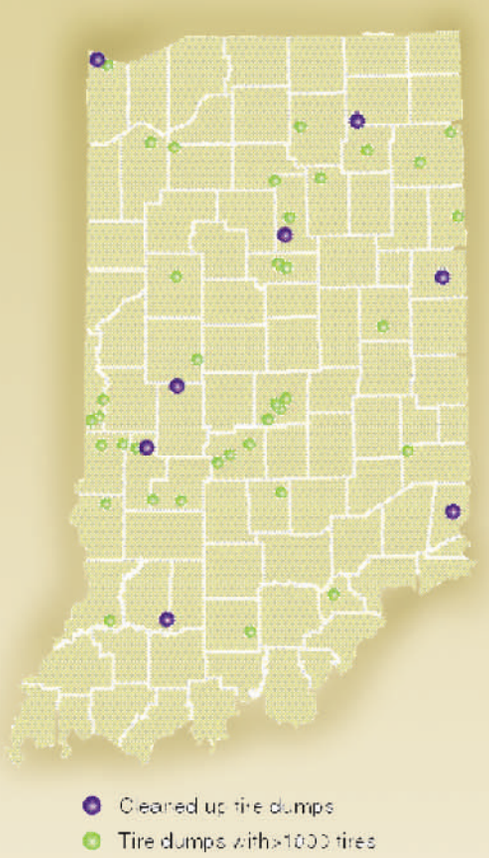
## TIRE DUMPS

On average, Indiana generates about one waste tire per person per year–approximately six million waste tires per year. Although the majority of these tires are now being properly disposed of within the state, historically this has not always been the case. Over the last five years, more than 5.4 million tires at illegal dump sites were cleaned up. IDEM has identified over five million waste tires in illegal dumps. This number may increase as additional illegal dumps are discovered.

IDEM has prioritized 43 illegal tire dumps in Indiana. In 2000, an estimated 2,306,000 tires were shredded and removed from tire dumps. The bulk of IDEM's cleanup efforts have been paid from the Waste Tire Fund, which the Indiana Legislature created in 1992. The law requires that 25 cents from the sale of every new tire in the state be deposited in the fund. Cleanup of additional sites using the state funds is planned for 2001.

### WasteTire Dumps

Source: IDEM Office of Land Quality, 2000




## ILLEGAL WASTE TIRE DUMP CLEAN UPS

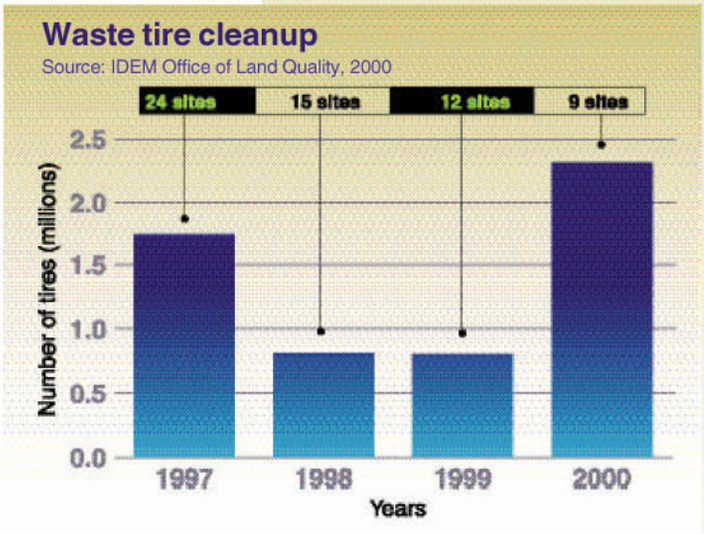
### WASTE TIRE CLEAN UPS A HIGH PRIORITY IN THE STATE

In 2000, the second largest illegal tire dump in Indiana, Wullenweber Dump, was put into retirement. An estimated one million car and truck tires, illegally dumped from the 1970s through 1988, blanketed the eight-acre site in Dearborn County about 14 miles north of Lawrenceburg. The waste tires were shredded and the rubber chunks trucked to Indiana landfills, where they were used for alternative daily cover.

Clean up is also underway at the Atwood G&M Recycling site in Kosciusko County - the largest tire dump in the state with an estimated 4.5 million tires. An old gravel pit in Atwood that was filled with tires, the G&M dump is an estimated 60 feet deep in places. Approximately 841,000 waste tires were shredded and removed in 2000. The clean up is anticipated to be completed in the summer of 2002.

### Waste tire cleanup

Source: IDEM Office of Land Quality, 2000




### Problems with Tire Piles

Large waste tire piles are breeding grounds for disease-carrying mosquitos. If set on fire, large tire piles burn with intense heat, blowing thick, black hazardous smoke downwind. Tire fires are difficult to extinguish, sometimes burning for days.